

First report of a lacaziosis-like disease (LLD) observed in the Australian Snubfin Dolphin (*Orcaella heinsohni*) in Darwin Harbour, Northern Territory, Australia

Carol Palmer^{1,2,3} and Amanda Peterson¹

¹ Marine Ecosystems, Flora and Fauna Division,
Department of Land Resource Management, Northern Territory Government,
PO Box 496, Palmerston, NT 0831, Australia.

² Research Institute for the Environment and Livelihoods,
Charles Darwin University, Darwin, NT 0909, Australia.

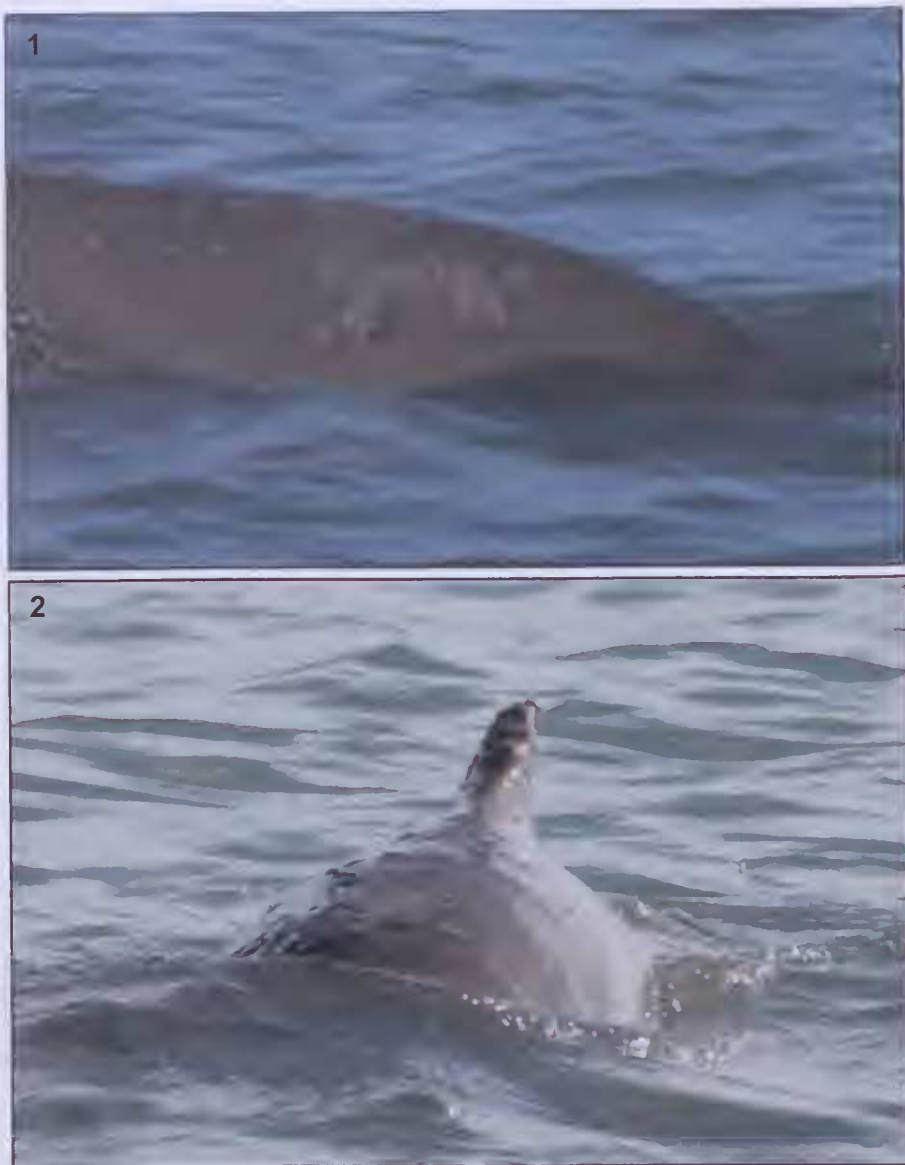
³ Email: caroll.palmer@nt.gov.au

Abstract

A lacaziosis-like disease (LLD) was photographed on the skin of three Australian Snubfin Dolphins (*Orcaella heinsohni*) in Darwin Harbour in 2008 and 2010, and this represents the first report of the skin disease recorded in Australia on this species of dolphin. Lacaziosis-like disease is considered non-lethal, but it could be indicative of decreasing water quality and/or exposure to potentially immunosuppressive anthropogenic or environmental pressures. Photo-identification data provides an efficient and cost-effective approach for documenting the occurrence of LLD and monitoring for the prevalence and incidence of skin lesions in a dolphin population.

Lacaziosis and lacaziosis-like disease (LLD) (the term used for skin disease that is morphologically similar or identical to lacaziosis, but for which a definitive diagnosis is missing) is a chronic mycotic disease which affects humans and dolphins (Hart *et al.* 2011). Lacaziosis is caused by the fungus *Lacazia loboi* (Hart *et al.* 2011), while LLD and skin lesions may be caused by viruses, bacteria, fungi and protozoans (Van Bresse *et al.* 2008). Causes could include potential human pathogens such as poxvirus and herpesvirus (Hart *et al.* 2012).

As part of a photo-identification study of coastal dolphins in Darwin Harbour conducted between 2008 and 2010 (Palmer 2010), LLD skin lesions were photographed on three individual Australian Snubfin Dolphins (*Orcaella heinsohni*) (hereafter referred to as Australian Snubfin); one individual on 28 March 2008, and two individuals on 22 March 2010 (Figures 1, 2). These are the first cases of LLD documented in the Australian Snubfin in Australia. There has been one unpublished observation of this disease in an Australian Snubfin in Queensland (Danielle Cagnazzi,



Figures 1, 2. Photographs showing extensive lacaziosis-like disease on the upper right side of the body (Figure 1), and back and dorsal fin (Figure 2) in an adult Australian Snubfin Dolphin (*Orcaella heinsobni*), Darwin Harbour, 22 March 2010. (Carol Palmer)

pers. comm.), and another in an Irrawaddy Dolphin (*Orcaella brevirostris*) in India (Guido Parra, pers. comm.). Generally, LLD is an emerging infectious disease that is known to occur in South America (Van Bressem *et al.* 2009) and lacaziosis itself has been reported in Bottlenose Dolphins (*Tursiops truncatus*) and Guiana Dolphins (*Sotalia guianensis*) (de Vries & Laarman 1973; Caldwell *et al.* 1975; Simões-Lopes *et al.* 1993; Reif *et al.* 2006, 2009; Van Bressem *et al.* 2009; Kiszka *et al.* 2009).

Photo-identification data provides an efficient and cost-effective approach to documenting the occurrence of skin lesions in free-ranging dolphin populations (Hart *et al.* 2012). Tracking the progress of skin lesions within an individual over time may be symptomatic of the overall health of that individual (Hart *et al.* 2012); moreover, monitoring for increasing prevalence and incidence of skin lesions in a population over time may be indicative of decreasing water quality and/or exposure to potentially immunosuppressive anthropogenic or environmental threats (Hart *et al.* 2012).

The only way to confirm the cause of any skin disease is by histological examination of biopsy samples from stranded animals. Lacaziosis and LLD have zoonotic potential (a zoonosis is a disease transmitted, sometimes by a vector, from a non-human species to humans). It is therefore essential that any person handling samples or affected animals uses the appropriate personal protective equipment and techniques (Van Bressem *et al.* 2009).

Acknowledgements

The project would never have been possible without the tremendous support of friends and colleagues from the Flora and Fauna Division and a host of volunteers who assisted in the boat-based surveys. Research was carried out under permits from the Parks and Wildlife Service of the Northern Territory (33840) and Charles Darwin University Animal Ethics Committee (A06018).

References

- Caldwell D.K., Caldwell M.C., Woodard J.C. *et al.* (1975) Lobomycosis as a disease of the Atlantic bottle-nosed dolphin (*Tursiops truncatus* Montagu, 1821). *American Journal of Tropical Medicine* 24, 105–114.
- De Vries G.A. and Laarman J.J. (1973) A case of lobo's diseases in the dolphin *Sotalia guianensis*. *Aquatic Mammals* 1, 26–33.
- Hart L.B., Rotstein, D.S., Wells R S., Bassos-Hull K. and Schwacke L.H. (2011) Lacaziosis and lacaziosis-like prevalence among wild, common bottlenose dolphins *Tursiops truncatus* from the west coast of Florida, USA. *Disease of Aquatic Organisms* 95, 49–56.
- Hart L.B., Rotstein D.S., Wells R.S. *et al.* (2012) Skin Lesions on Common Bottlenose Dolphins (*Tursiops truncatus*) from three sites in the Northwest Atlantic, USA. *PLoS ONE* 7(3): e33081. doi:10.1371/journal.pone.0033081 (accessed 1 July 2013).
-

- Kiszka J., Van BresseM M.F. and Pusineri C. (2009) Lobomycosis like disease and other skin conditions in Indo-Pacific bottlenose dolphins *Tursiops aduncus* from the Indian Ocean. *Disease of Aquatic Organisms* 84, 151–157.
- Palmer C. (2010) *Darwin Harbour Coastal Dolphin Project*. Interim Report, Biodiversity Unit, Department of Natural Resources, Environment, the Arts and Sport (NRETAS), Darwin.
- Reif J.S., Mazzoil M.S., McCulloch S.D. *et al.* (2006) Lobomycosis in Atlantic bottlenose dolphins (*Tursiops truncatus*) from the Indian River Lagoon, Florida. *Journal of the American Veterinary Medical Association* 228, 104–108.
- Reif J.S., Peden-Adams M.M., Romano T.A. *et al.* (2009) Immune dysfunction in Atlantic bottlenose dolphins (*Tursiops truncatus*) with leishmaniasis. *Medical Mycology* 47, 125–135.
- Simões-Lopes P.C., Paula G.S., Xavier, F.M. and Scaramelo A.C. (1993). First case of lobomycosis in a bottlenose dolphin on Southern Brazil. *Marine Mammal Science* 9, 329–331.
- Van BresseM M.F., Van Waerebeek K., Flach L. *et al.* (2008) Skin diseases in cetaceans. Paper SC/60/DW8 presented to the IWC Scientific Committee, Santiago, Chile 30 May–27 Jun 2008. International Whaling Commission, Cambridge. www.iwcoffice.org/documents/sci_com/SC60docs/SC-60-DW8 (accessed 1 July 2013).
- Van BresseM M.F., de Oliveira Santos M.C. and de Faria Oshima J.E. (2009) Skin diseases in Guiana dolphins (*Sotalia guianensis*) from Paranagua estuary, Brazil: a possible indicator of a compromised marine environment. *Marine Environmental Research* 67, 63–68.